

INTERROGATION OF DIET-INDUCED CHANGES IN THE MICROBIOME USING METAPROTEOMIC ANALYSIS OF CROHN'S DISEASE PATIENTS RECEIVING A CATERED HIGH FIBER, LOW FAT DIET INTERVENTION

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A prospective dietary intervention study in 70 Crohn's disease patients using metaproteomics found that 8 weeks of catered high-fiber, low-fat meals induced greater changes in gut microbiota composition and function compared to diet counseling alone or changes seen in healthy household controls.

KEY POINTS

- Patients receiving catered meals (17g fiber/1000 calories, 20-25% fat) showed increased proteins for carbohydrate metabolism and reduction in *Collinsella aerofaciens*, a species linked to pro-inflammatory responses in CD, while one-time counseling produced little metaproteomic change.
- *Prevotella copri*, a biomarker for diet improvements in dysbiosis, increased continuously in CD patients over time, eventually resembling patterns in household controls, though the underlying bacterial composition driving carbohydrate metabolism differed between patients and controls.
- Disease location mattered: patients with ileal-only disease versus colonic involvement showed different bacterial contributors to carbohydrate metabolism changes despite similar functional protein expression increases.
- The study design allowed tight comparison by having 22 household controls receive identical catered meals as their CD patient household members, and metaproteomics provided a functional dimension to assess dietary effects on the microbiome in dysbiosis.

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